481—61.11 (135C) Mechanical requirements.

61.11(1) Steam and hot water heating and domestic water heating systems shall comply with the following:

a. Boilers shall be installed to comply with the division of labor services rules promulgated under Iowa Code chapter 89 and 875—Chapters 90 to 96, Iowa Administrative Code. (III)

b. Boiler feed pumps, condensate return pumps, fuel oil pumps and hot water heating pumps shall be connected and installed to provide standby service if any pump malfunctions. (III)

c. Supply and return mains and risers of cooling, heating, and steam systems shall have valves which isolate various sections of each system. Each piece of equipment shall have a valve at the supply and return ends. (III) (Exception 2)

61.11(2) Insulation shall be provided for the following within the building: (Exception 3)

a. Steam supply and condensate return pipe; (III)

b. Pipe above 125° F, if it is exposed to contact by residents; (II, III)

c. Chilled water, refrigerant, and other process pipe and equipment operating with fluid temperatures below ambient dew point; (III)

d. Water supply and roof drainage pipe on which condensation may occur; (III)

e. Boilers, smoke-breaching and stacks; (III)

f. Hot water pipe above 180° F, and all hot water boilers, heaters, and pipe; and (III)

g. Other pipes, ducts, and equipment as necessary to maintain the efficiency of the system. (III)

Insulation including finishes and adhesives on the interior surface of ducts, pipes, and equipment, shall have a flame-spread rating of 25 or less, and a smoke-develop rating of 50 or less. This shall be determined by an independent testing laboratory in accordance with National Fire Protection Association (NFPA) Standard 255, 1984 Edition. (III) (Exception 3)

Insulation on cold surfaces shall include an exterior vapor barrier. (III)

61.11(3) The heating system shall be capable of maintaining a temperature of 78° F. (II, III)

The cooling system shall be designed to maintain all living spaces within the comfort zone. The comfort zone is defined in the ANSI/American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 55-1981 or the 1985 ASHRAE Fundamentals Handbook. (III) (Exception 4)

a. All air-supply and air-exhaust systems shall be mechanically operated and shall have ducts from a central system to and from each room. All fans serving exhaust systems shall be located at the discharge end of the system. The ventilation rates shown in Table 2 are minimum acceptable rates, and shall not preclude higher ventilation rates. (III) (Exception 2)

b. The bottoms of ventilation openings shall be not less than 3 inches above the floor of any room. (III) (Exception 3)

c. All central systems designed to heat and cool the building with recirculation of air shall be equipped with a minimum 2-inch deep, 8- to 11-pleat per foot, class 2 Underwriters' Laboratories, self-extinguishing, nonwoven, cotton, downstream, or final filter with a minimum efficiency of 25 to 30 percent and average arrestance of 90 percent, tested in accordance with ASHRAE Standard 52-76. This does not preclude the additional use of a prefilter upstream of the air-handling equipment to extend the service life of the downstream, or final filter. (III) (Exception 5)

d. Evaporative cooling shall not be substituted for direct expansion refrigeration in the air-conditioning system. (III) (Exception 4)

e. Any alternate ventilation system designed to attain an equivalent degree of odor control and purity of air to resident areas shall be considered for approval under conditions in rules 481—58.2(135C) and 481—59.2(135C). (III)

f. Mechanical ventilation over cooking equipment and dishwashing equipment shall be designed to remove hot air and inhibit cold air above hot food or dishes. (III) (Exception 3)

g. Mechanical ventilation shall be provided in food storerooms to maintain temperature and humidity for the type of food being stored. (III) (Exception 4) Facilities built before November 21,

1990, shall provide mechanical ventilation if freezers, refrigerators or compressors are located in the storeroom.

h. Outdoor ventilation air intakes shall be at least 25 feet from the exhaust outlets of any ventilating system, combustion equipment stacks, or noxious fumes. The bottom of outdoor intakes serving central air systems shall be located as high as practical, but not less than 6 feet above grade level, or, if installed through the roof, 3 feet above roof opening. (III) (Exception 3)

i. The ventilation system shall be designed and balanced to provide the general pressure relationship to adjacent areas shown in the Pressure Relationship and Ventilation Table 2. Through-the-wall air-conditioning units will not be used to calculate make-up air. (III) (Exception 2)

j. Corridors, attics or crawl spaces shall not be used as a plenum to supply air to or exhaust air from any rooms. (III) (Exception 3)

k. The air system for resident rooms, between smoke-stop partitions, shall be operated with common switches. (III) (Exception 3)

l. If the fire alarm system is activated, the air distribution system shall shut down. (III)

m. Air-handling duct systems shall meet the requirements of 1987 NFPA Standards 90A and 90B. Supply and return registers shall not be at the same level and shall be designed to inhibit stratification. (III) (Exception 4)

n. Fire and smoke dampers shall be constructed, located and installed in accordance with the requirements of 1987 NFPA Standard 90A, 90B and 101.

o. Range and dishwasher exhaust hoods in food preparation centers shall have a minimum exhaust rate of 60 cubic feet per minute per square foot of hood face area. Face area is the open area from the exposed perimeter of the hood to the average perimeter of the cooking surfaces. (Exception 4)

(1) All hoods over cooking ranges shall be equipped with grease filters, a fire extinguishing system, and heat-activated fan controls.

(2) Openings for cleaning shall be provided every 20 feet in horizontal exhaust duct systems serving hoods.

(3) Conditioned air shall be supplied to balance exhausted air.

(4) Special hood designs shall be evaluated. (III) (Exception 4)

p. Rooms containing fuel-fired heating units or other fuel-fired equipment shall be provided with sufficient outdoor air to maintain combustion rates of equipment and reasonable temperatures in the room and in adjoining areas. (III) (Exception 3)

q. Filter beds shall be located upstream of the air-conditioning equipment unless a prefilter is employed. A prefilter shall be upstream of the equipment. The main filter bed may then be located farther downstream.

(1) Filter frames shall be durable and carefully dimensioned and shall provide an airtight fit within enclosing duct work.

(2) All joints between filter segments and the enclosing duct work shall have gaskets or be sealed to provide a positive seal against air leakage. (III) (Exception 2)

r. All perimeter duct work under the slab shall be encased in lightweight or insulating concrete and sloped to a plenum low point. (III) (Exception 3)

s. Laundry rooms shall be supplied with sufficient conditioned outside air to balance the amounts exhausted or used for combustion. (III) (Exception 3)

t. The amounts of air and pressure relationship set forth in Table 2 shall be provided. (III) (Exception 3)

u. Condensate piping from cooling coils shall be a minimum of ¾ of an inch inside diameter and provided with openings for cleaning every 10 feet. (III) (Exception 4)

v. Attics or crawl spaces shall not be used to house heating or cooling equipment. (III) (Exception 3)

w. Rooms used for heating and cooling equipment must be accessible through a swinging door. (III) (Exception 3)

Table 2
PRESSURE RELATIONSHIPS AND VENTILATION OF CERTAIN AREAS OF NURSING FACILITIES

Area Design	Pressure Relationship to Adjacent Areas	Minimum Air Changes of Outdoor Air Per Hour Supplied to Room	Minimum Total Air Changes Per Hour Supplied to Room	All Air Exhausted Directly to Outdoors
Resident Room	E	2	2	Opt. (#1)
Resident Area Corridor	E	2	2	Opt. (#3)
Physical Therapy	N	2	6	Opt. (#1)
Soiled Work Area or Soiled Holding	N	2	10	Yes
Toilet Room	N	Opt. (#1)	10	Yes
Bathroom	N	Opt. (#3)	10	Yes
Housekeeping Closet	N	Opt. (#3)	10	Yes
Food Preparation Area	E	2	10	Yes
Warewashing Room	N	Opt. (#2)	10	Yes
Laundry, General	E	2	10	Opt. (#4)
Soiled Linen Sorting and Storage Area	N	Opt. (#4)	10	Yes
Employees' Lounge	N	2	6	Yes
Lounge	N (#5)	2	6	Yes (#5)
*Designated Smoking Areas	N	2	6	Yes

P = Positive N = Negative E = Equal Opt. = Optional

#1 Room may be exhausted through adjoining toilet room.
#2 Make-up air may be supplied through kitchen.
#3 Corridor may be exhausted through adjoining service areas.
#4 Laundry may be exhausted through the soiled area.
#5 Pressure relationships in lounges are subject to Exception 4.

*Exception 4

61.11(4) Every facility shall have a complete interior plumbing system. (I, II, III)

a. All plumbing and other pipe systems shall be installed in accordance with the requirements of the Iowa state plumbing code and applicable provisions of local ordinances. (II, III)

b. All pipes below grade or in concrete slabs shall be type K, soft copper. There shall be no joints below the slab.

c. Water supply systems shall meet the following requirements:

(1) All facilities shall have a potable water source from a city water system or a private source which complies with the regulations and is approved by the department of natural resources. (I, II, III)

(2) Systems shall be designed to supply water to the fixtures and equipment at a minimum pressure of 15 pounds per square inch during maximum demand periods. (III)

(3) Plumbing fixtures in janitors' rooms and soiled workrooms shall be provided with hot water. (III)

(4) Each water service main and branch main shall have valves. Stop valves shall be provided at each fixture. Bathtubs or showers shall be equipped with screwdriver stop valves. (III) (Exception 2)

(5) Backflow preventers (vacuum breakers) shall be installed on hose bibbs, janitors' sinks, bedpan flushing attachments, hair care sinks, and on all other threaded fixtures to which hoses or tubing can be attached. (I, II, III)

(6) Water softeners shall not supply cold water to the kitchen, drinking fountains, or ice machines. (III) (Exception 4)

(7) Hot water distribution systems shall provide hot water as specified at each hot water outlet at all times. (See Table 3) A circulating pump in a hot water system shall meet these requirements. A circulating pump is not required in facilities licensed for 15 or fewer beds. (III)

(8) The hot water system shall be designed to supply 110° F to 120° F water to all resident lavatories, tubs and showers. (II, III)

Table 3
HOT WATER USE

	Resident Areas	Dietary	Laundry
Gallons per hr. per bed**	3	2	2
Temperature (°F)	110	120*	

*Provisions shall be made to provide 180°F rinse water at dishwasher. (May be provided by a separate booster heater.)

**Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design shall also be affected by temperatures of cold water used for mixing, length of run, and insulation relative to heat loss or other factors. As an example, the total quantity of hot water needed will be less when the temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

(9) Rescinded IAB 10/7/09, effective 11/11/09.

d. Drainage systems shall meet the following requirements:

(1) Sewage shall be collected and disposed of in a manner approved by the department. Disposal into a municipal system meets this requirement. (III)

(2) Private sewage systems shall conform to rules promulgated by the department of natural resources. (III)

(3) Drainage pipes which pass above food preparation, serving, and food storage areas shall be enclosed. (III)

(4) Plastic pipe may be used in any drain-waste-vent system in accordance with the state plumbing code 641—Chapter 25. (III)

(5) Openings for pipe cleaning shall be no more than 50 feet apart in a horizontal drain line. (III) (Exception 2)

(6) Floor drains with appropriate grates shall be provided for all mechanical equipment rooms, laundries, kitchens, dishwashing areas, soiled utility rooms, basement floors, any other area where water may collect on the floor, shower stalls and in front of showers or bath units. (III) (Exception 4)

(7) Foundation drains shall be provided in accordance with subrule 61.3(9). (III) (Exception 4)

61.11(5) Before completion of the contract for new construction and final acceptance of the facility, the contractor shall certify that all mechanical systems have been tested and balanced, and that the installation and performance of these systems conform to plans and specifications.

61.11(6) Upon completion of the contract, the owner shall be furnished with a complete set of manufacturer's operating, maintenance, and preventive instructions. A parts list with numbers and descriptions for each piece of equipment shall be included. The owner shall be instructed in the operational use of systems and equipment as required. (III) (Exception 3)

[**ARC 8189B**, IAB 10/7/09, effective 11/11/09]